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Bioretention Nutrient Removal & Hydraulic Function @ 2 Field Sites

Bill Hunt, Ph.D., PE
Assistant Professor &
Extension Specialist

Biological and Agricultural Engineering

Research Objectives

- Calculate Annual Mass Removal
  - Nutrients & Some Metals
- Compare function between winter & summer
- Compare Function of Anaerobic & Conventional Design
  - Hydrology & Water Quality
- Verify Positive TP removal by Low P-Index Soils
- Estimate Water Loss due to Exfiltration

Greensboro Cells

Constructed 2000-1
Monitored since 2002

2 Cells STP/WS = 0.05
High P-Index (86-100)

G1- Internal Water Storage,
G2- Conventional

Effluent Concentration (GSO)

Change in Drainage Configuration

N=21, 7/2002 – 12/2003

Pollutant	Conventional Mean (mg/L)	Anaerobic Mean (mg/L)	Sig. Diff (P<0.05)
TP	3.02	0.52	YES
TN	5.30	4.52	NO
Zn	*0.025*	*0.025*	NO
TSS	129	23	NO

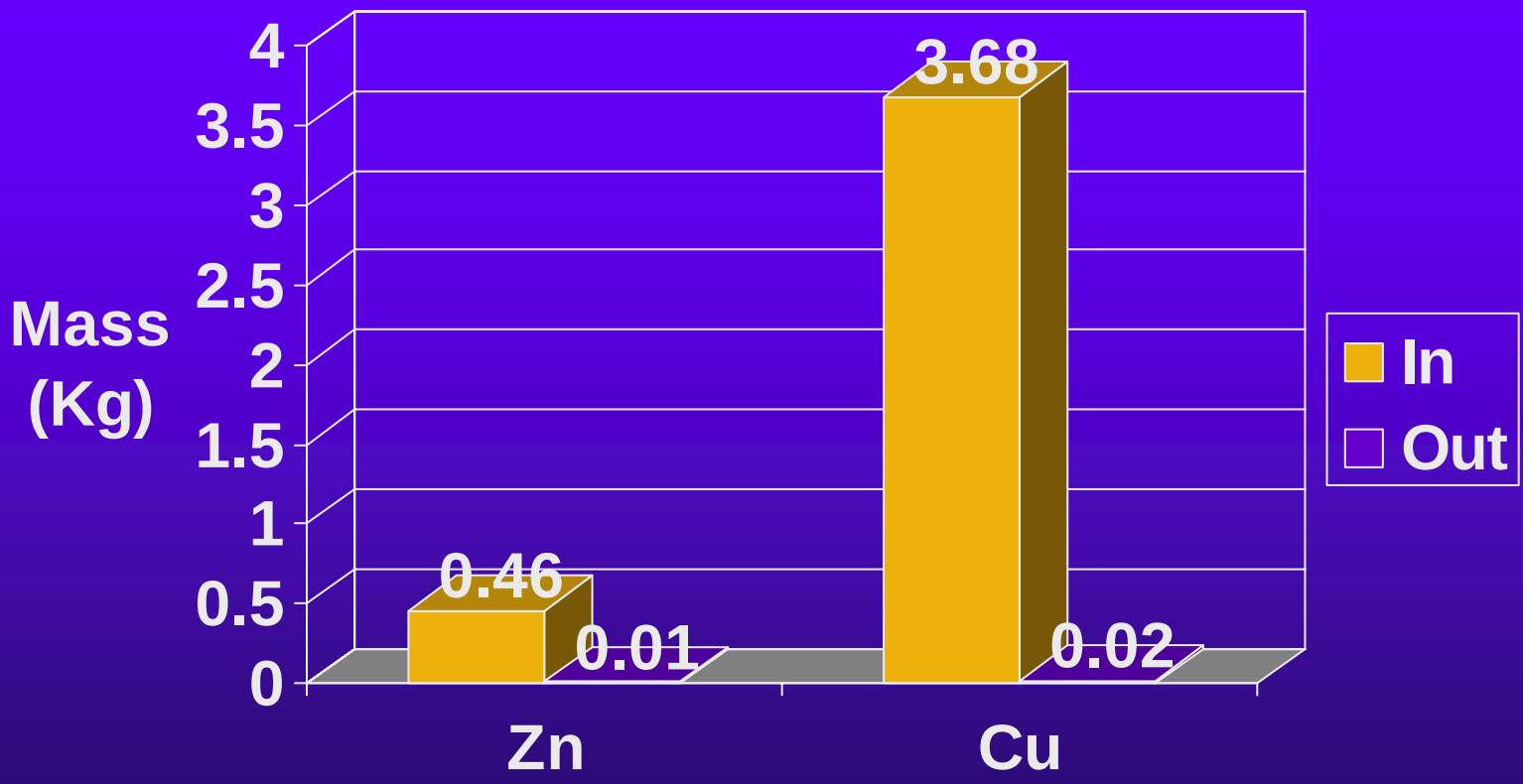
Difference in Outflow

6/2002-5/2003

Season	OF:RO	Significant Diff (P<0.05)
Spring	0.14	Winter
Summer	0.07	Winter
Fall	0.13	Winter
Winter	0.54	Spring, Summer, Fall

Annual Loadings

Greensboro Cell G2



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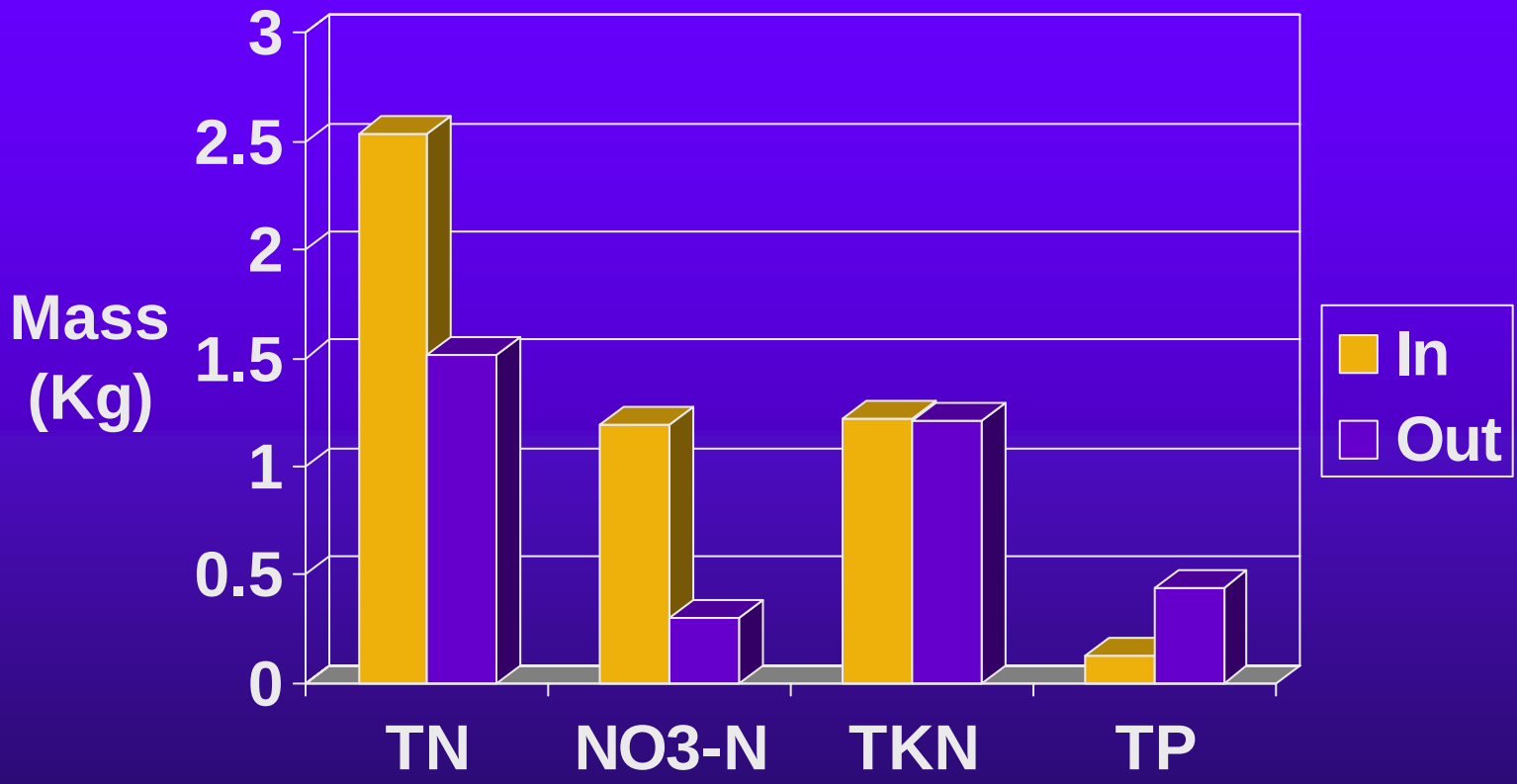
Annual Loadings

Greensboro Cell G2



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Louisburg (NC) Park Bioretention Cells

Constructed Winter 2003-2004
One cell lined with 10 mm plastic
Both cells of equal STP/WS ratio
Backfill soil with LOW P-index

B-R Design Points:

- **Do NOT use Agricultural Soil as B-R Fill media (Low P-Index Fill media desired)**
- **Anaerobic Design preferred in TP sensitive areas**
- **Urban Buffers**